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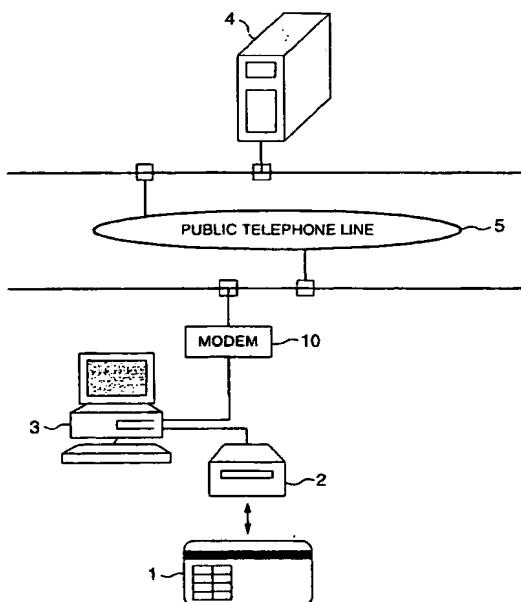
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(54) IC card processing system and processing method

(57) An IC card system includes an IC card (1), an IC card read/write unit (2) for reading/writing the IC card, a communication unit (10) intervening for connection to a communication line network (5), a controller (3) for controlling the IC card read/write unit and communication unit, and a server system (4) connected to the communication line network. The IC card (1) is written with at least specified access destination information for accessing the server system (4), the controller (3) automatically accesses the server system (4) through the communication unit (10) in accordance with the access destination information in the IC card, and the server system (4) offers information to an information offering destination (1, 3, 4) determined automatically by information to be offered which is processed by the server system (4), an information offering destination (1, 3, 4) already written in the IC card (1) inserted in the IC card read/write unit (2) or an information offering destination (1, 3, 4) designated by a user after the insertion of the IC card (1).

FIG.1



Description

The present invention relates to an IC card system using an IC card, more particularly to an IC card processing system and method which conform to the transmission and reception on communication network.

IC cards have been utilized by an electronic computer such as personal computer and work station or by a portable terminal in various fields such as recording and managing authentication of individuals and information of individuals by utilizing IC cards or carrying out payment by IC cards. In order to execute a process for read/write of data and an application program which are recorded in an IC card or a specified process by utilizing data read out of an IC card, the operational environment including the aforementioned electronic computer needs a driver application program for accessing the IC card, an interface application program necessary for a user to carry out smooth operation or an application program for performing a manager-like operation which manages these application programs. Especially, for the sake of conforming to an IC card which has been subjected to version-up with the aim of adding the function related to security of the IC card and expanding the function, the operational environment must be adjusted by partly or totally replacing the application program stored in such a host machine as the aforementioned computer or portable terminal with an up-to-date application program or by adding an up-to-date application program, and an IC card conforming to the IC card subjected to version-up must be reconstructed. Then, to acquire the up-to-date application program needed at that time, a magazine or an attached manual is confirmed and thereafter, contact is made to the offerer to receive the up-to-date application program stored in a medium including a floppy disc and work of fetching the received up-to-date application program into the operational environment is carried out.

When the work of replacement and addition of the specified application program is generated by the function addition and function expansion as described above, the system manager has to access the specified application offerer and to this end, uses the host machine such as personal computer or work station to reconstruct an intended operational environment by downloading the specified application program from a network such as an internet to the operational environment inclusive of the host machine or by installing the specified application from a recording medium such as a floppy disc to the operational environment and performing environment setting in accordance with an instruction in a guidance or a manual displayed on a selected screen. In order to down-load or install the specified application program, it is necessary to follow such a procedure as license contract with the application offerer and payment of the rent, so that work load imposed on the system manager is increased and the operational environment setting is so complicated as to disturb

widespread use of the IC card system.

The present invention contemplates elimination of the conventional drawbacks and it is an object of the present invention to improve or simplify the capability of operation for acquiring, through a communication line, information concerning IC cards and information necessary for an operational environment in which an application program, data or service is operated on a host machine such as personal computer or work station. Further, the invention intends to take advantage of easy service receiving so as to improve various kinds of function realizable by the use of IC cards and enrich card related services.

According to the present invention, to accomplish the above object, in a system having, for example, an IC card written with operation information for start and execution of an application program and service which are stored in the IC card and access destination information for an offerer which offers data, an IC card read/write unit, a host machine unit such as personal computer, work station or portable telephone set for controlling the IC card read/write unit and communication through a communication circuit network, and a server system connected to the communication network such as a public telephone line to offer various kinds of information, the host machine unit reads the access destination information stored in the IC card through the IC card read/write unit to automatically connect to the server system representing an information source connected to the communication circuit network, and the server system automatically offers the offering operation information and data to the host machine unit, IC card or an information recipient designated by a utilizer to cause it to construct an environment in which the application program and service stored in the IC card can be executed.

In the drawings

Fig. 1 is a diagram showing the construction of an IC card system according to a first embodiment of the present invention.

Fig. 2 is a flow chart showing the operation of the IC card system according to the first embodiment of the invention.

Fig. 3 is a diagram showing the construction of an IC card system according to a second embodiment of the present invention.

Fig. 4 is a flow chart showing the operation of the IC card system according to the second embodiment of the invention.

Fig. 5 is a diagram showing the construction of an IC card system according to a third embodiment of the present invention.

Fig. 6 is a flow chart showing the operation of the IC card system according to the third embodiment of the invention.

Fig. 7 is a diagram showing the construction of an IC card system according to a fourth embodiment of the

invention.

Fig. 8 is a flow chart showing the operation of the IC card system according to the fourth embodiment of the invention.

Embodiments of the present invention will be described hereunder with reference to the accompanying drawings.

Referring to Fig. 1, an IC card system according to a first embodiment of the invention comprises an IC card 1 having a structure in which a program or data can be written or erased optionally, an IC card read/write unit 2 for read/write of the contents of the IC card 1, a host machine 3 comprised of, for example, a personal computer or a work station, a public telephone line 5, a modem 10 for connecting the host machine 3 to the public telephone line 5, and a server system 4 connected to the public telephone line 5.

The host machine 3 is connected with the IC card read/write unit 2 and the modem 10 and has a memory to fulfil the function of controlling the IC card read/write unit 2 and modem 10. A memory of the IC card 1 detachably mountable to the IC card read/write unit 2 is stored with at least specified access destination information for the server system 4, which specified access destination information is represented by a public telephone line number of the connection terminating server system.

The operation of the above-described IC card system will be described with reference to a flow chart of Fig. 2.

When the IC card 1 is mounted to the IC card read/write unit 2 ("Yes" in step S2-1), the host machine 3 decides in accordance with information based on ATR (Answer to Rest) whether the mounted IC card 1 is a card for accessing server system 4 which is written with at least the specified access destination information for the server system 4 (step S2-2). If the mounted IC card 1 is not the card for accessing server system 4 ("No" in step S2-2), the host machine 3 informs a user that the server system 4 is not permitted to be accessed with the mounted IC card 1, by using a display unit attached to the host machine 3 (step S2-9).

On the other hand, if the mounted IC card 1 is a card for accessing server system ("Yes" in step S2-2), the host machine acquires the public telephone line number of the connection terminating server system from the memory of the IC card 1 (step S2-3) and uses the acquired public telephone line number to automatically cause the modem 10 to connect the line to the partner server system 4 (step S2-4). If this automatic connection operation succeeds in line connection to the server system 4 ("Yes" in step S2-5), the server system 4 undergoing line connection automatically starts a specified application program on the server system 4 according to the system construction in the present embodiment (step S2-6). If the line is not permitted to be connected to the server system 4 ("No" in step S2-5), an indication to this effect and an indication as to whether the opera-

tion of line connection to the server system 4 will be retried after predetermined seconds are displayed on the display unit of the host machine 3 to urge the user to decide whether the line connection operation is resumed or stopped (step S2-10).

In the present embodiment, the system is such that the contents of information to be offered and the destination to which the offered information is down-loaded are automatically determined by the aforementioned automatically started application program per se (step S2-7) and if the down-load destination is the host machine 3, the information offered from the server system 4 is down-loaded to the memory means such as hard disc or floppy disc of the host machine 3 (step S2-8) but if the down-load destination is the IC card, the information offered from the server system 4 is down-loaded to the memory of the IC card 1 via the host machine 3 (step S2-11).

In the previously described example, when the line is connected from the host machine 3 to the server system 4, the application program in the server system 4 is automatically started to immediately offer the information but alternatively, the server system 4 undergoing line connection may first transmit a guidance for offering information guide so that the guidance for information guide may be displayed on the display unit of the host machine 3 and information selected from the guidance by the user may be down-loaded to the host machine 3 or the IC card 1. In further alternative, the down-load destination of the information offered from the server system 4 may be selected and designated by the user by using an indication on the display unit of the host machine 3.

Furthermore, the specified access destination information for server system (the public telephone line number of the connection terminating sever system), a code for specifying the contents of information desired to be offered and a code indicative of a destination to which the information to be offered is down-loaded may be written to the IC card 1. In this case, the kind of the information to be offered and the down-load destination are informed to the server system 4 from the host machine 3 undergoing line connection to the server system 4 by using the public telephone line number of the connection terminating server system 4, and responsive to the information, the server system 4 transfers the desired information to the designated down-load destination.

Referring now to Fig. 3, an IC card system according to a second embodiment of the invention will be described. In the figure, components equivalent to those in the previous embodiment will be designated by identical reference numerals and will not be described for avoidance of prolixity (this holds true for a third embodiment to be described later).

In the present embodiment, acquisition of information by the use of a portable telephone set incorporating IC card read/write means is exemplified. In Fig. 3, a port-

able telephone set 6 incorporates IC card read/write means and a host machine 3' representing another unit connected to a public telephone line 5 is, for example, a personal computer or a work station which is connected to the public telephone line 5 via a modem not shown. An IC card 1 in the present embodiment which is detachably mountable to the IC card read/write means of the portable telephone set 6 has the function of electronic money and is written with at least specified access destination information for a server system 4 and a public telephone line number of the host machine (another unit) 3' to which information is down-loaded, the specified access destination information being represented by a public telephone line number of the connection terminating server system.

The operation of the IC card system of the present embodiment will be described with reference to a flow chart of Fig. 4.

When the IC card 1 is mounted to the IC card read/write means of the portable telephone set 6 ("Yes" in step S4-1), a controller of the portable telephone set 6 decides whether the mounted IC card 1 is a card for accessing server system which is written with at least specified access destination information for the server system (step S4-2). If the mounted IC card 1 is not the card for accessing the server system 4 ("No" in step S4-2), the controller of the portable telephone set 6 informs the user that the server system 4 is not permitted to be accessed with the mounted IC card 1, by using a display device provided in the portable telephone set 6 (step S4-11).

On the other hand, if the mounted IC card 1 is the card for accessing server system ("Yes" in step S4-2), the controller of the portable telephone set 6 acquires the public telephone line number of the connection terminating server system from the memory of the IC card 1 (step S4-3) and operates automatically to connect the line to the partner server system 4 by using the acquired public telephone line number (step S4-4). When this automatic connection operation succeeds in line connection to the server system 4 ("Yes" in step S4-5), the server system 4 undergoing line connection automatically starts a specified application program on the server system 4 according to the construction of the system in the present embodiment, too (step S4-6). If the line is not permitted to be connected to the server system 4 ("No" in step S4-5), an indication to this effect and an indication as to whether the line connection operation to the server system 4 is retried after predetermined seconds are displayed on the display device of the portable telephone set 6, thereby urging the user to determine whether the line connection operation is resumed or stopped (step S4-12).

The contents of information offered by the application program of server system 4 started by the aforementioned line connection is determined by this application program per se and the started application program informs the portable telephone set 6 of charge in-

formation for the offered information contents (step S4-7). Receiving this, the portable telephone set 6 transfers electronic money information by an amount of money designated by the server system 4 from the mounted IC card 1 to the server system 4 (step S4-8). After confirming receipt of the electronic money information (collection of charge), the server system 4 urges the portable telephone set 6 to inform a public telephone line number of a down-load destination described in the IC card 1 and acquires the number (step S4-9). Then, the server system 4 uses the acquired public telephone line number to connect the line to the different unit (host machine) 3' which is the down-load destination and down-loads the aforementioned predetermined information contents to the host machine 3'. The down-load destination may be either the IC card 1 or the host machine 3; or alternatively, after the IC card 1 is inserted into the IC card read/write means of the portable telephone set 6, the down-load destination may be designated.

As described above, according to the present embodiment, if carrying about the portable telephone set 6 incorporating the IC card read/write means, the user can down-load predetermined information to a designated unit wherever the user is.

In the aforementioned example, the application program of the server system 4 is automatically started when line connection from the portable telephone set 6 to the server system 4 is set up and the information is offered to the different unit (host machine) 3' which is the down-load destination as soon as collection of charge based on electronic money is confirmed. But alternatively, the server system 4 undergoing line connection may first transmit a guidance for offering information guide to the portable telephone set 6 to cause the display device of the portable telephone set 6 to display the guidance for information guide and after collection of charge based on electronic money for information selected from the guidance by the user is confirmed, the information may be down-loaded to the designated different unit (host machine) 3'. Further, a code for specifying the contents of information to be offered may be written to the IC card 1.

Referring to Fig. 5, an IC card system according to a third embodiment of the present invention comprises a server management system 9 connected to a public telephone line 5 and a plurality of server systems 4A, 4B, ..., 4N which offer various kinds of services and application programs. Each of the server systems 4A, 4B, ..., 4N is connected to the server management system 9 through a dedicated network so that the server management system 9 may collectively manage the respective server systems 4A, 4B, ..., 4N. An IC card 1 detachably mountable to an IC card read/write unit 2 has the function of electronic money and is written with at least specified access destination information for the server management system 9, which specified access destination information is represented by a public telephone line number of the connection terminating server manage-

ment system. The server management system 9 manages the IC card 1 independently of a host machine 3 to deal with a problem raised between each server system and the IC card.

The operation of the IC card system of the present embodiment will be described with reference to a flow chart of Fig. 6.

When the IC card 1 is mounted to the IC card read/write unit 2 ("Yes" in step S6-1), the host machine 3 decides whether the mounted IC card is a card for accessing server management system which is written with at least specified destination information for the server management system (step S6-2). If the mounted IC card 1 is not the card for accessing server management system ("No" in step S6-2), the host machine 3 informs a user that the server management system is not permitted to be accessed with the mounted IC card 1, by using the display unit attached to the host machine 3 (step S6-15).

On the other hand, if the mounted IC card 1 is the card for accessing server management system ("Yes" in step S6-2), the host machine 3 acquires a public telephone line number of the connection terminating server management system from the memory of the IC card (step S6-3) and operates automatically to connect the line to the partner server management system 9 by using the acquired public telephone line number (step S6-4). If this automatic connection operation succeeds in the line connection to the server management system 9 ("Yes" in step S6-5), the server management system 9 undergoing line connection automatically starts specified application programs on the server systems 4A, 4B, ..., 4N (step S6-6) according to the construction of the system. If the line is not permitted to be connected to the server management system 9 ("No" in step S6-5), an indication to this effect and an indication as to whether the line connection operation to the server management system 9 is retried after predetermined seconds are displayed on the display unit of the host machine 3 to urge the user to determine whether the line connection operation is resumed or stopped (step S6-16).

The contents offered by the application program of server management system 9 started by the aforementioned line connection is determined by this application program per se and the started application program informs the host machine 3 of guide information of offered information contents indicative of the contents of application program and service offered by each of the server systems 4A, 4B, ..., 4N under the command of the server management system 9 as well as charge information for individual offered information pieces (step S6-7). Receiving this information, the host machine 3 displays the guide information of the offered information contents and the charge information for the individual offered information pieces on the display unit of the host machine 3 to urge the user to select a server system representing an access object desired by the user (step S6-8).

Thus, when the user selects a desired server sys-

tem (selects desired offering information), an indication to this effect is informed from the host machine 3 to the server management system 9, and responsive to this information, the server management system 9 switches

5 the connection to the selected server system (step S6-9). At that time, the server management system 9 down-loads access destination information for the selected server system to the IC card 1 (step S6-10). In steps following the step S6-10, access to this server system selected by the IC card 1 can be permitted directly without being done by the route of the server management system 9.

10 With the access to the selected server system started, an application program inherent to this server system is started and the started application program of the server system informs the host machine 3 of charge information for offered information contents (step S6-11). Receiving this information, the host machine 3 transfers electronic money information from the mounted IC card 1 to the server system by an amount of money designated by the server system (step S6-12). At that time, after confirming the information rent displayed on the display unit of the host machine 3, the user may transfer the electronic money information by depressing a confirmation button.

20 After confirming the collection of charge based on the aforementioned electronic money information, the server system informs the host machine 3 of guidance information for designating a destination to which the offered information is down-loaded and responsive to this information, the host machine 3 displays the aforementioned guidance information on the display unit. When the user selects a desired down-load destination through the display (step S6-13), an indication to this effect is informed from the host machine 3 to the server system. Receiving this information, the server system down-loads offered information to the designated down-load destination (step S6-14). In the present embodiment, the hard disc, floppy disc or RAM of the host machine 3 or the memory of the IC card 1 is selected as the down-load destination.

30 40 45 Thus, according to the present embodiment, operation for selection of an origin from which information is acquired can be facilitated by utilizing the server management system which manages the plurality of server systems.

50 55 While in the above example the down-load destination desired by the user is selected by causing the server system to inform the guidance information for designating the down-load destination, the down-load destination of the offered information may be determined automatically by the application program per se which is started automatically in the server system as in the foregoing first embodiment. Alternatively, a code for specifying the contents of information to be offered (specifying a server system desired to be accessed) and/or a code for specifying a destination to which information is down-loaded may be written in the IC card 1.

Referring now to Fig. 7, an IC card system according to a fourth embodiment of the invention will be described. Essentially, the system construction of the present embodiment resembles that of the first embodiment. In the IC card system of the present embodiment, a host machine 3 is connected with an IC card read/write unit 2 and a modem 10 and has the function of controlling the IC card read/write unit 2 and modem 10 and deciding data fetched from the IC card 1 by means of the IC card read/write unit 2. The IC card 1 mounted/dismounted to or from the IC card read/write unit 2 is stored with at least a bank account application 11 for controlling data such as receipt/payment of money in a bank account of an owner of the IC card 1 and public line telephone number data 12 representing specified access destination information for a server system 4 of a company which offers operation information adapted to start the bank account application 11. The server system 4, on the other hand, is stored with operation information 13 for execution of the bank account application program 11.

The operation of the IC card system of the present embodiment will be described with reference to a flow chart of Fig. 8.

When the IC card 1 is mounted to the IC card read/write unit 2 (step S8-1), the host machine 3 acquires application program list information stored in the mounted IC card 1 from the IC card 1 (step S8-2). Next, the host machine 3 acquires application program registration information indicating application programs executable on the host machine (step S8-3). Then, the host machine 3 compares the application program list information with the application program registration information to decide whether the application program stored in the IC card 1 is executable on the host machine 3 (step S8-4). Here, description will continue on the assumption that the object application program is the bank account application program 11.

When the result of decision indicates that the bank account application program 11 is registered ("Yes" in step S8-4), the bank account application program 11 is executed on the host machine 3 (step S8-5). For example, when balance confirmation, confirmation of record of receipt/payment of money and record data in connection with a bank account of an owner of the IC card 1 are printed out to end the processing, the host machine 3 controls the IC card read/write unit 2 so as to discharge the IC card 1 (step S8-6). Subsequently, money is paid to the bank account (step S8-13) and then the operation information used for execution of the application program is subjected to erasure (step S8-14). If the operation information should be erased, the operation information is erased (step S8-15) to end the processing. On the other hand, when the absence of operation information is determined in the step S8-14, the program proceeds to end. For example, at that time, the host machine 3 confirms, from the application program registration information, version information of the operation in-

formation for execution of the bank account application program 11 on the host machine 3, controls the IC card read/write unit 2 to read public line number data (access information for the server system) stored in the IC card

- 5 1, connects to the server system 4 via a public telephone line 5 by controlling the modem 10, and receives up-to-date version information of the operation information for execution of the bank account application program 11 to compare the up-to-date version information with the
- 10 version information of the operation information on the host machine 3. If the latter version information is older than the former version information received from the server system 4, the host machine 3 may receive the up-to-date operation information from the server system
- 15 4. Further, upon reception of the operation information, the bank account application program may automatically be registered in the application program registration information or the host machine manager or the owner may be urged to select registration or non-registration so as to perform selective registration. The operation information is information for specifying the application program.

On the other hand, when the bank account application program 11 is not registered in the application program registration information ("No" in step S8-4), the host machine 3 controls the IC card read/write unit 2 so as to read public line number data (access destination information for server system) stored in the IC card 1 (step S8-7) and automatically operates to connect the line to the server system 4 via the public telephone line 5 by controlling the modem 10 (step S8-8). If the normal connection to the server system 4 is not permitted ("No" in step S8-9), a message to the effect that the connection to the server system 4 is refused is displayed (step S8-12a) and the host machine 3 controls the IC card read/write unit 2 so as to discharge the IC card 1 (step S8-6a). If the normal connection to the server system 4 is permitted ("Yes" in step S8-9), the host machine 3 receives operation information for execution of the bank account application program 11 from the server system 4 (step S8-10). The host machine 3 thus receiving the operation information brings the bank account application program 11 into a state in which the bank account application program 11 is executable by being added with the function to execute the bank account application program 11. Under this state, the bank account application program 11 is executed on the host machine 3 (step S8-11). A message to the effect that the connection to the server system 4 is accepted is displayed (S8-12). When the processing ends, the host machine 3 controls the IC card read/write unit 2 so as to discharge the IC card 1 (step S8-6). At that time, in order to make full use of the storage medium resource, the operation information received by the host machine 3 may automatically be erased or a message as to whether the information is erased may be displayed to permit the host machine manager or the owner to selectively erase the operation information.

As described above, according to the present embodiment, the information necessary for constructing an operational environment when a suitable application (or service) such as the bank account application program 11 of IC card 1 is operated on the host machine 3 can be acquired easily and steadily from the server system 4 via the communication line, thereby bringing about advantages that the capability of operation for the above information acquisition can be improved and the operation can be simplified.

In the present invention, the contents of information offered from the server system 4 (or server management system 9) to the host machine 3 for controlling the IC card read/write unit 2, the host machine 3' representing a different unit which is designated as an information offering destination or the IC card may be of any kinds including various kinds of service such as tour guide, weather forecast, sports information or electronic shop guide or various kinds of application software such as business application program or amusement application program. In addition to the above, the following may be considered as information offered from the server system 4.

For example, when the host machine 3 or 3' or the IC card 1 is written with a predetermined application program on the market, key information for permitting operation of the predetermined application program and version-up information of the predetermined application program such as function addition information or function change information may be enumerated. Further, when the host machine 3 or 3' or the IC card 1 is written with a predetermined application program on the market and the written predetermined application program is partly lacks, supplementary information which replenishes the partly lacking predetermined application program to place it in completely operative condition may be considered.

Further, when the IC card 1, which initially has only access management information for the aforementioned server system 4, is desired to function as an IC card dedicated to a special use (for example, IC card serving as electronic money available only for shops in a certain area), function addition information may be considered as the information offered from the server system 4. In this case, if the above specified utilization is selected from a plurality of choices by interactively using the display unit, general purpose natures of the special utilization applied to the IC card 1 can be promoted.

While, in the foregoing embodiments, the information communication has been described as using the public telephone line, information communication using a dedicated network may be within the framework of the present invention.

Claims

1. An IC card system having an IC card (1), IC card read/write means (2) for reading/writing the IC card, communication means (10) intervening for connection to a communication line network (5), control means (3) for controlling the IC card read/write means and the communication means and a server system (4) connected to the communication line network, characterized in that:
 - 5 said IC card (1) is written with at least specified access destination information for accessing said server systems (4);
 - 10 said control means (3) automatically accesses said server system (4) through said communication means (10) in accordance with the access destination information in said IC card (1); and
 - 15 said server system (4) offers information to an information offering destination (1, 3, 4) determined automatically by information to be offered which is processed by said server system (4), an information offering destination (1, 3, 4) which has already been written in said IC card (1) inserted in said IC card read/write unit (2) or an information offering destination (1, 3, 4) designated by a user after the insertion of said IC card (1).
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2. An IC card system having an IC card (1), IC card read/write means (2) for read/writing the IC card, communication means (10) intervening for connection to a communication line network (5), control means (3) for controlling the IC card read/write means and the communication means and a server management system (9) connected to the communication line network to collectively manage a plurality of server systems (4A, 4B, ..., 4N), characterized in that:
 - 5 said IC card (1) is written with at least specified access destination information for accessing said server management system (9);
 - 10 said control means automatically accesses said server management system (9) through said communication means (10) in accordance with the access destination information in said IC card (1);
 - 15 said server management system (9) connects said control means (10) to one of said server systems (4A, 4B, ..., 4N) which is selectively designated by a user or is written in said IC card; and
 - 20 said one server system offers information to an information offering destination determined automatically by information to be offered which is processed by said one server system, an in-

formation offering destination written in said IC card (1) which is inserted in said IC card read/write means (2) or an information offering destination designated by the user after the insertion of said IC card (1). 5

3. An IC card system according to claim 1 or 2, characterized in that said information offering destination is any one of said control means (3) for controlling said IC card read/write means (2) and said IC card (1). 10

4. An IC card system according to claim 1 or 2, characterized in that said information offering destination determined automatically by said information to be offered is any one of said control means (3) for controlling said IC card read/write means (2) and said IC card (1). 15

5. An IC card system according to claim 1 or 2, characterized in that said information offering destination is said control means (3) for controlling said IC card read/write means (2), said IC card (1) or a different unit (3') including control means and connected to said communication line network (5). 20

6. An IC card system according to claim 5, characterized in that access destination information for said different unit (3') connected to said communication line network (5) is written in said IC card (1). 25

7. An IC card system according to claim 5, characterized in that a predetermined application program written in said control means (3) for controlling said IC card read/write means (2) or in said different unit (3') including control means and connected to said communication line network (5) is firstly brought into a completely operable state when receiving predetermined information for use permission by accessing said server system (4) or said server management system (9). 30

8. An IC card system according to claim 1 or 2, characterized in that said IC card (1) has a structure which permits a program and data to be written and said IC card (1) can fetch and utilize information to be offered by said server system (4). 35

9. An IC card system according to claim 8, characterized in that when receiving all pieces of information in a predetermined application program by accessing said server system (4) or said server management system (9), said IC card (1) brings said received predetermined application program into a utilizable state. 40

10. An IC card system according to claim 8, characterized in that said predetermined application program 45

written in said IC card (1) is firstly brought into a completely operable state when receiving predetermined information by accessing said server system (4) or said server management system (9). 50

11. An IC card system according to claim 8, characterized in that said IC card (1) can be added with the function or changed in the function by means of information received from said server system (4) by accessing said server system (4) or said server management system (9). 55

12. An IC card system according to claim 8, characterized in that said IC card (1) is allowed to function as an IC card dedicated to a special utilization by means of information received from said server system (4) by accessing said server system (4) or said server management system (9).

13. An IC card system according to claim 12, characterized in that said special utilization can be selected from a plurality of choices by interactively using a display unit (3).

14. An IC card system according to any one of claims 1 to 13, characterized in that said IC card (1) is written with electronic money information and when information offered by said server system (4) is acquired, a payment process based on said electronic money information is carried out.

15. An IC card system according to any one of claims 1 to 14, characterized in that said server system (4) is on a network system (5) connected to a public telephone line (5).

16. An IC card system according to any one of claims 1 to 14, characterized in that said server system (4) is on a dedicated network system (5) and that said communication means (10) has the function of connecting to said dedicated network.

17. An IC card system having an IC card (1), IC card read/write means (2) for reading/writing the IC card, communication means (10) intervening for connection to a communication line network (5), data decision means (Fig. 8, S8-4) for deciding data acquired by the IC card read/write means (2), control means (3) for controlling the IC card read/write means (2), the communication means (10) and the data decision means, storage means, provided in said control means (3), for storing data and an application program necessary for operating the control means, and a server system (4) connected to the communication line network (5), characterized in that:

said data decision means (Fig. 8, S8-4) has the

function of deciding the contents stored in said storage means;
 said IC card (1) is recorded with a single or plural pieces of access destination information for said server system (4) which stores data and an application program and offers operation information necessary for execution of said application program necessary for performing a specified process;
 said server system (4) has said operation information for executing said application program on said control means (3); and
 when said data decision means (Fig. 8, S8-4) determines that said operation information is not stored in said storage means at the time that said IC card (1) is mounted to said IC card read/write means (2), said control means (3) controls said IC card read/write means (2) so as to acquire the single or plural pieces of access destination information from said IC card (1), controls said communication means (10) so as to access a single or plural server systems (4) conforming to said access destination information and stores said operation information in said storage means, whereby by storing said operation information, said control means (3) is added with an additional program (Fig. 8, S8-4) for supporting said application program and said control means (3) is rendered to be ready to execute said application program.

18. An IC card system according to claim 17, characterized in that after the execution of said application program of said IC card (1) ends, said control means (3) automatically or selectively erases said operation information stored in said storage means in order to erase the additional program added to said control means (3).

19. A method of transmitting information in an IC card system having an IC card (1), IC card read/write means (2) for reading/writing the IC card, communication means (10) intervening for connection to a communication line network (5) a server management system (9), connected to the communication line network (5), for collectively managing a plurality of server systems (4), said IC card (1) being inserted to said IC card read/write means (2) to transmit information at least between said IC card and each of said server systems (4), characterized in that said method comprises the steps of:
 (a) precedently writing at least access destination information for accessing said server management system (9) in said IC card (1);
 (b) accessing said server management system (9) through said communication means (10) in accordance with said access destination infor-

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mation in said IC card (1); and
 (c) transmitting information processed in said server system (4) to any one of an information offering destination (1, 3, 4) determined automatically by the information to be offered which is processed by said server system (4), an information offering destination (1, 3, 4) already written in said IC card (1) inserted in said IC card read/write means (2) and an information offering destination (1, 3, 4) selectively designated by a user.

20. A method of transmitting information in an IC card system having an IC card (1), IC card read/write means (2) for reading/writing the IC card, communication means (10) intervening for connection to a communication line network (5), data decision means for deciding data acquired by the IC card read/write means, control means (3) for controlling the IC card read/write means, the communication means and the data decision means, storage means, provided in said control means (3), for storing data and an application program (Fig. 8, S8-5) necessary for operating said control means (3), and server systems (4) connected to the communication line network (5), said IC card being inserted in said IC card read/write means to transmit information between at least said IC card and each of said server systems, characterized in that said method comprises the steps of:
 (a) precedently writing a single or plural pieces of access destination information for accessing a single or plural server systems (4) in said IC card (1);
 (b) precedently providing data, an application program and operation information (Fig. 8, S8-10) for specifying said application program in each of said server systems (4);
 (c) when said IC card (1) is inserted in said IC card read/write means (2) and it is determined that said operation information is not stored in said storage means, acquiring the single or plural access destination information pieces from said IC card;
 (d) accessing said single or plural server systems in accordance with said single or plural access destination information pieces;
 (e) transferring said operation information from said server system accessed in accordance with said access destination information to said storage means and storing it therein;
 (f) adding an additional program such that said application program specified by said operation information is supported; and
 (g) executing said application program by said control means (3).

FIG.1

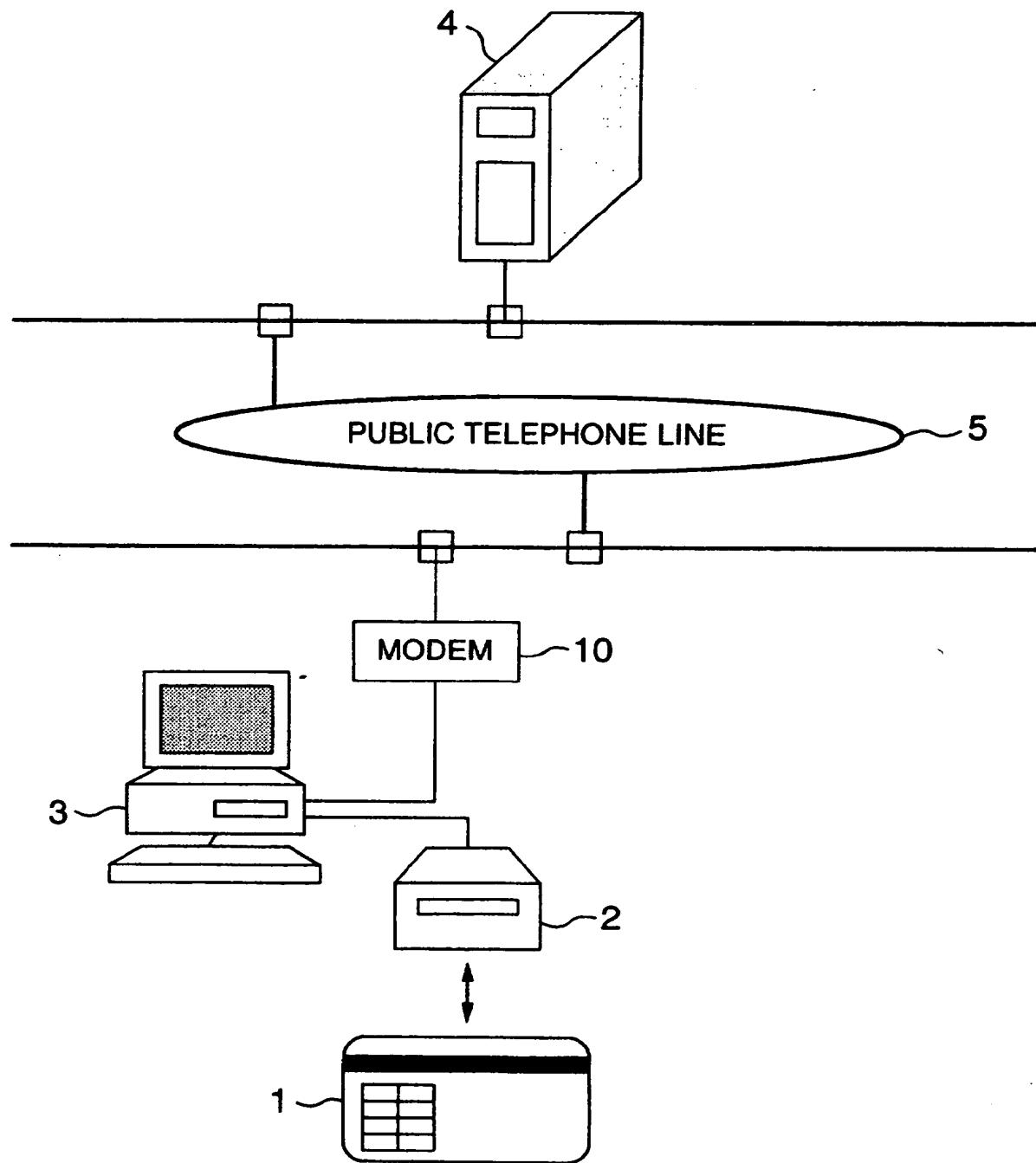


FIG.2

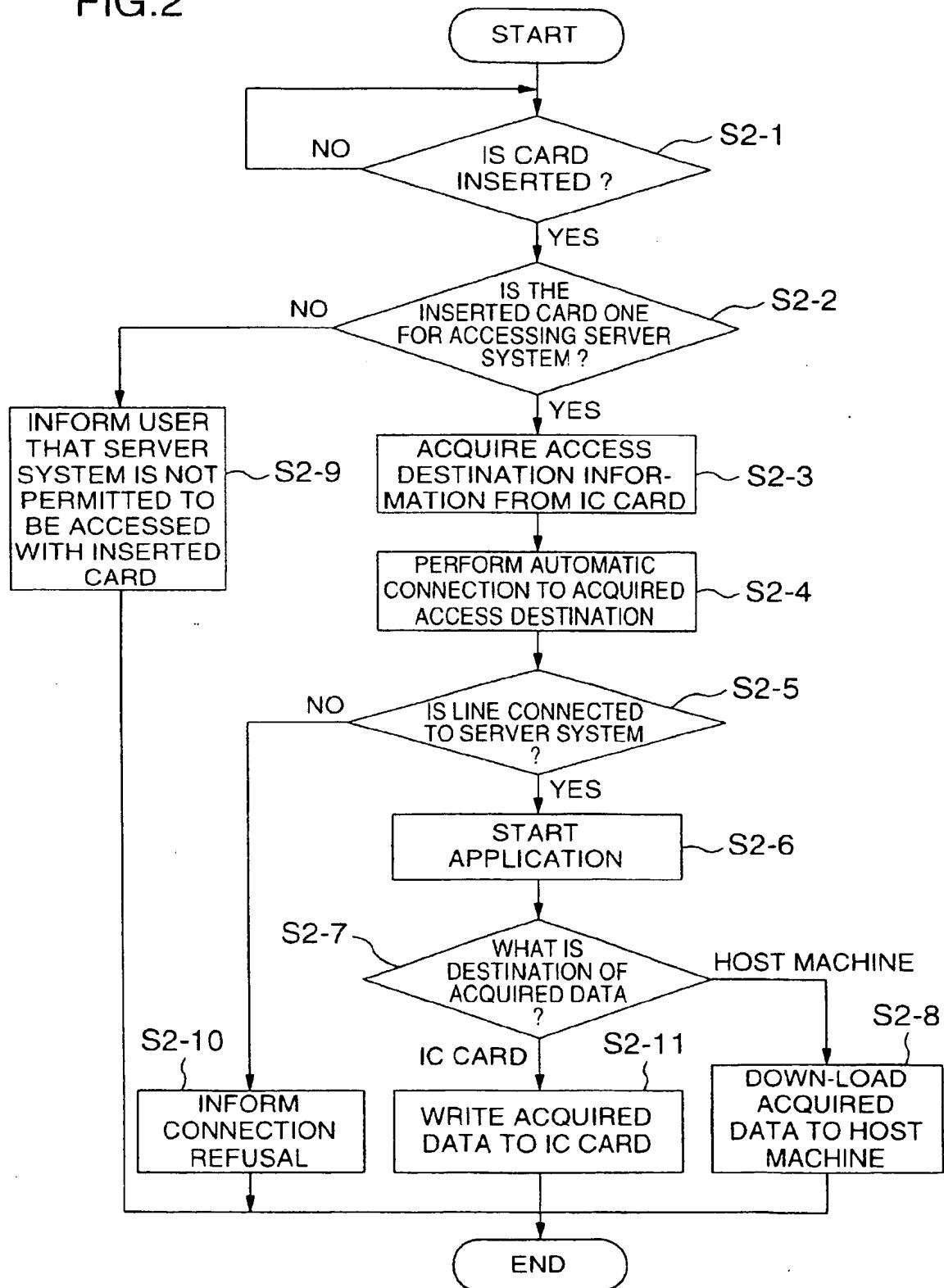


FIG.3

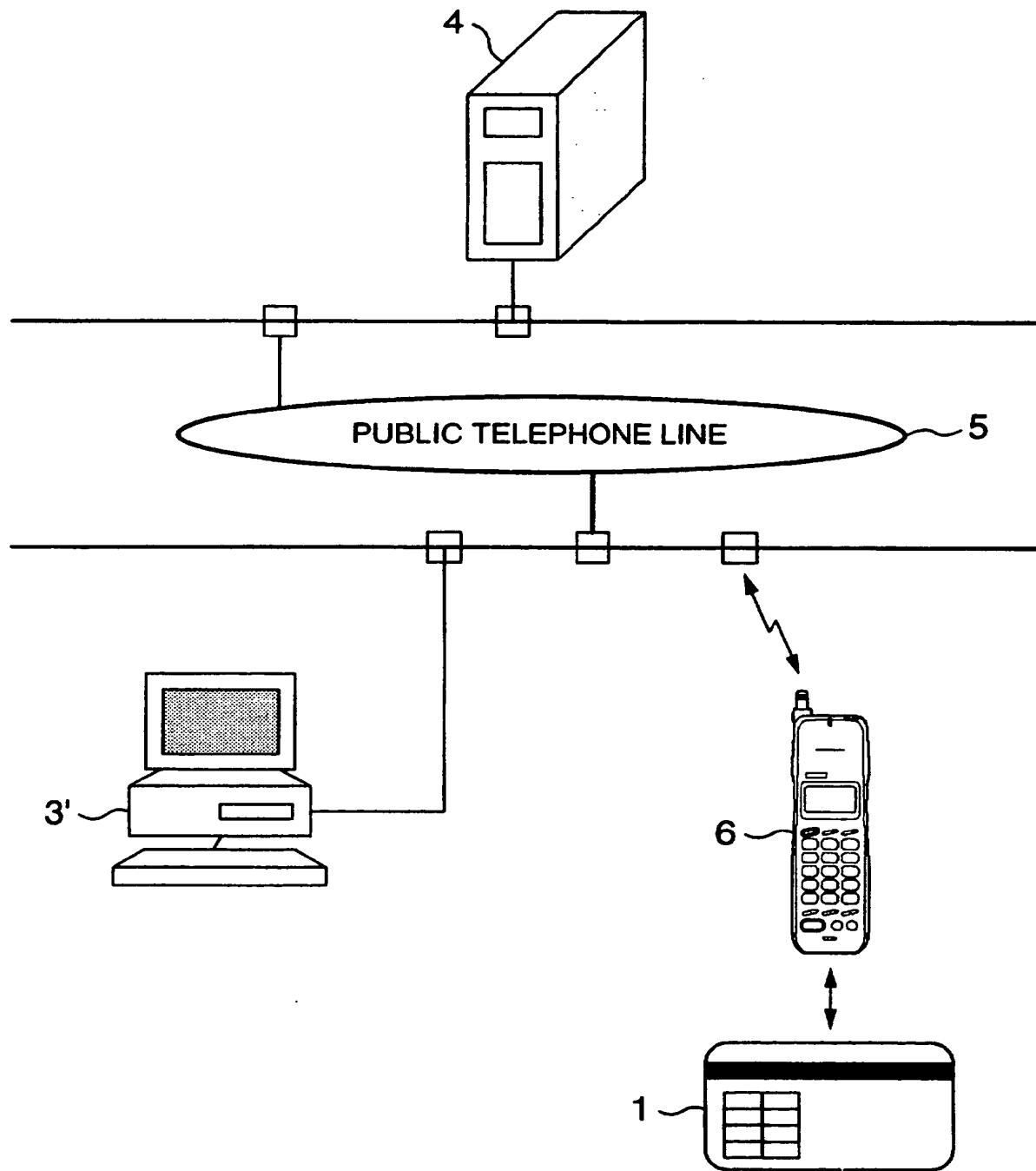


FIG.4

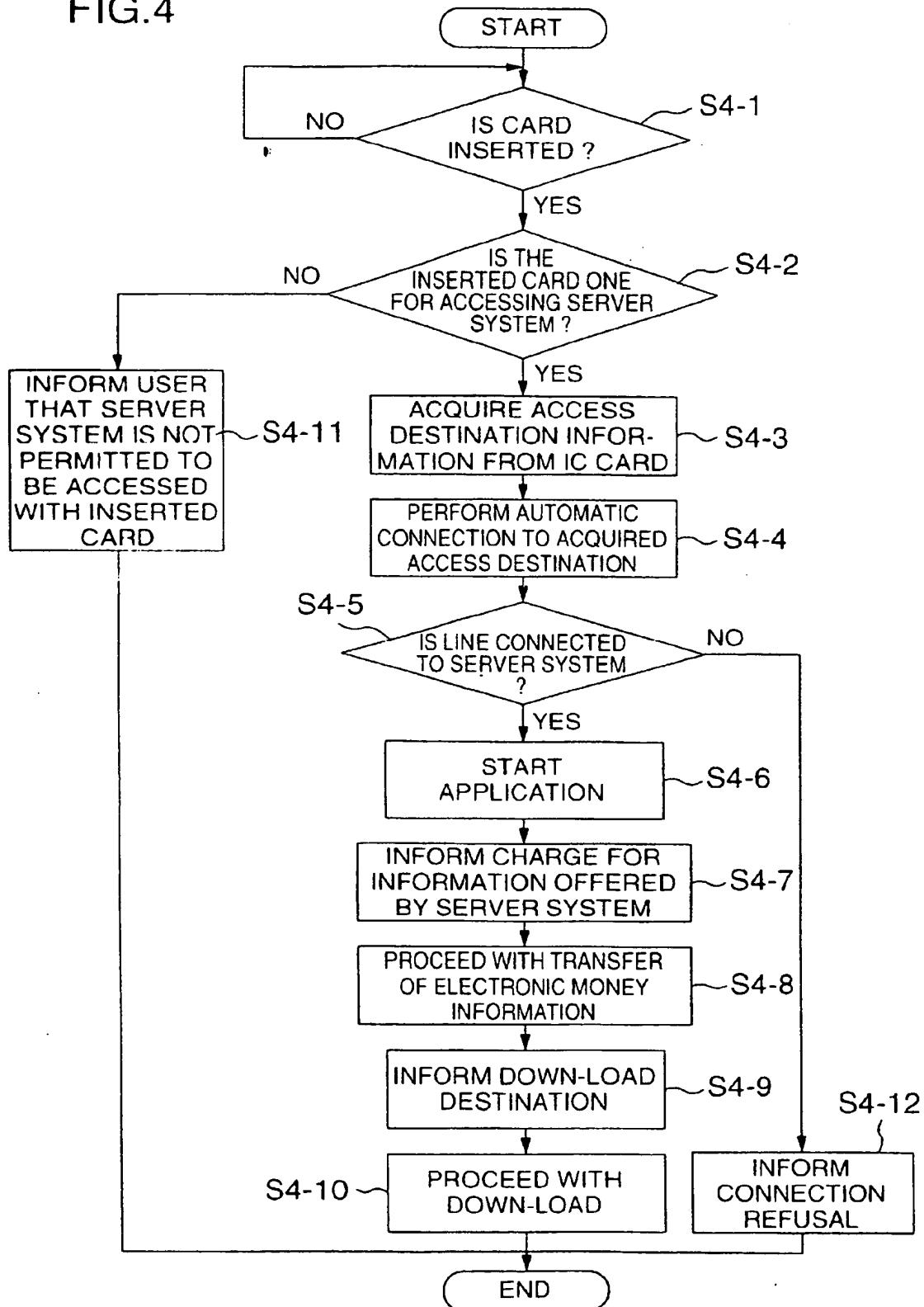


FIG.5

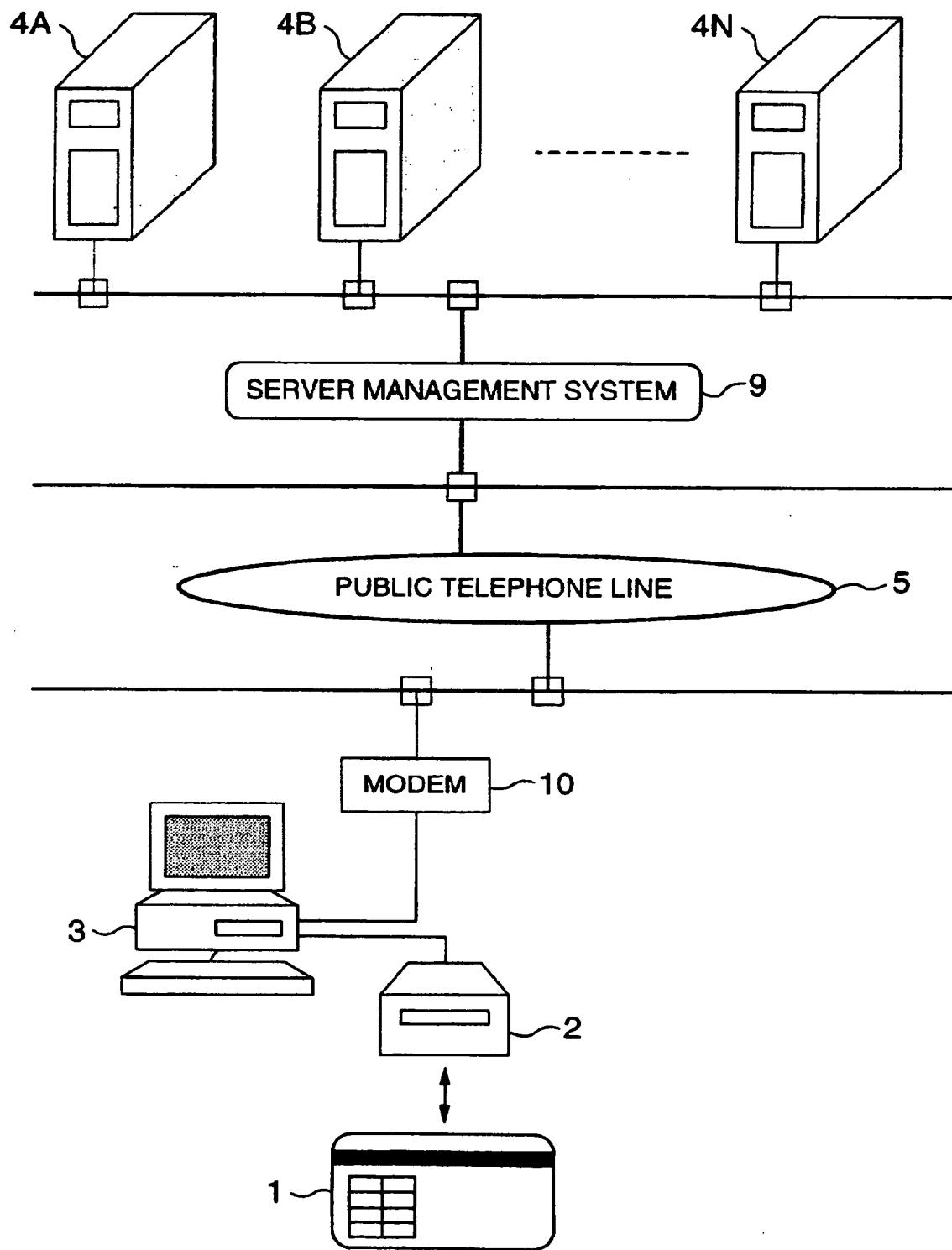


FIG.6

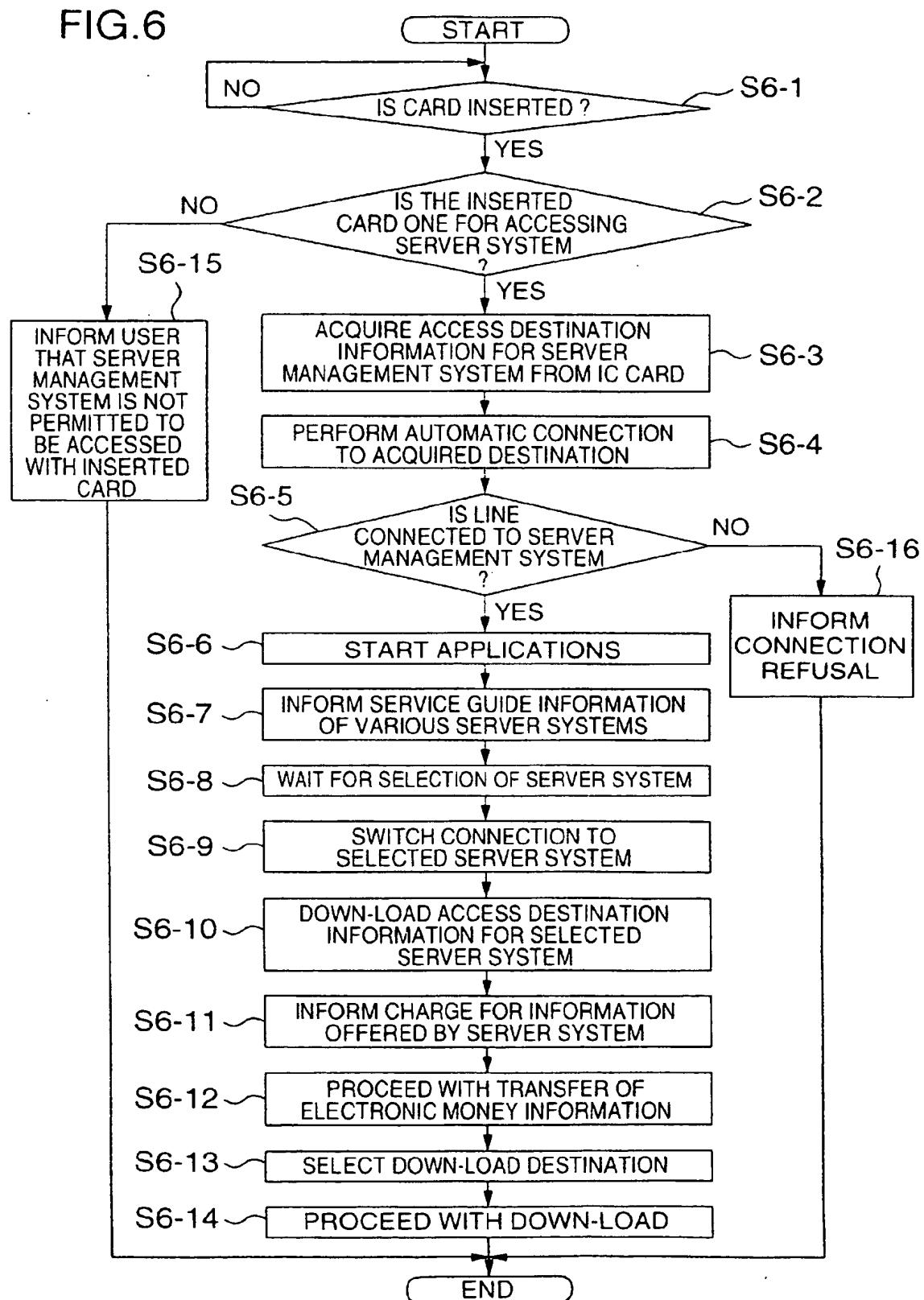


FIG.7

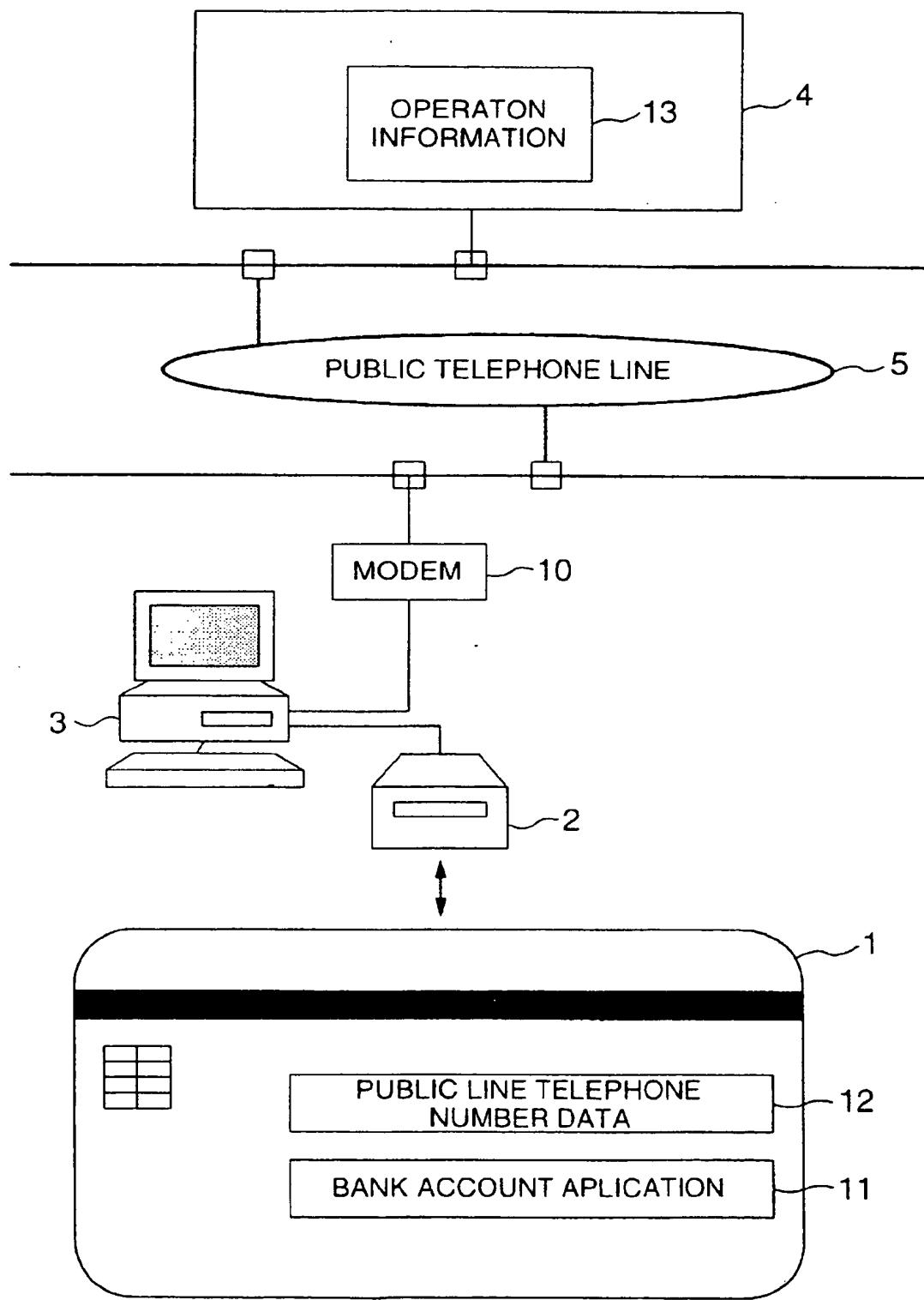
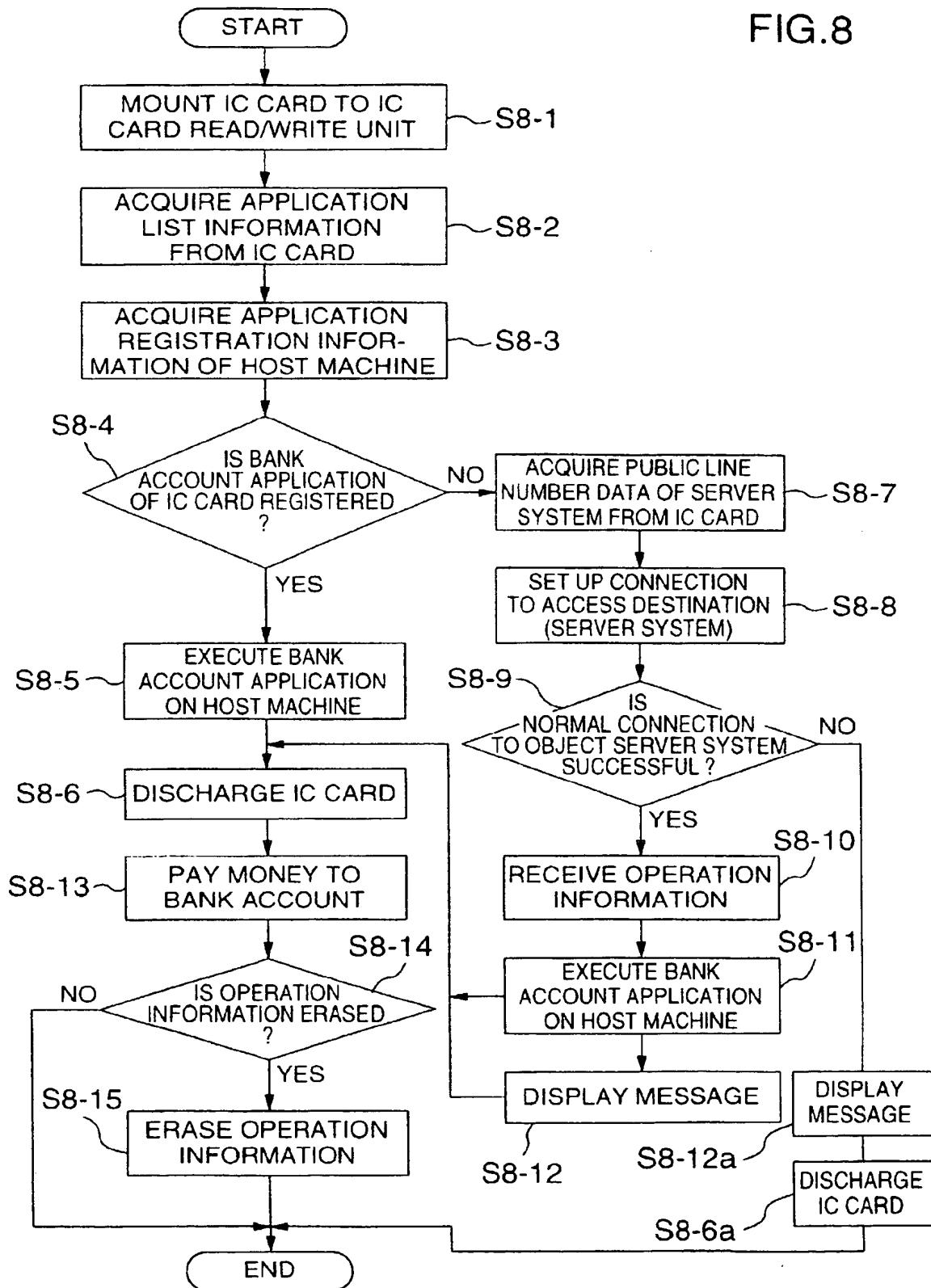


FIG.8





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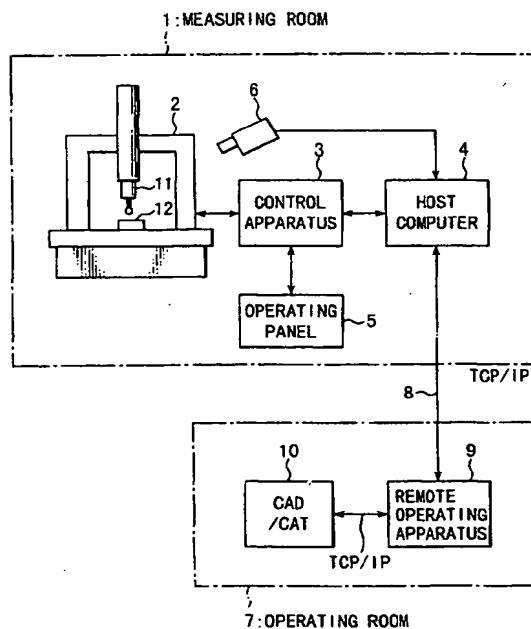
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(54) IC card processing system and processing method

(57) An IC card system includes an IC card (1), an IC card read/write unit (2) for reading/writing the IC card, a communication unit (10) intervening for connection to a communication line network (5), a controller (3) for controlling the IC card read/write unit and communication unit, and a server system (4) connected to the communication line network. The IC card (1) is written with at least specified access destination information for accessing the server system (4), the controller (3) automatically accesses the server system (4) through the communication unit (10) in accordance with the access destination information in the IC card, and the server system (4) offers information to an information offering destination (1, 3, 4) determined automatically by information to be offered which is processed by the server system (4), an information offering destination (1, 3, 4) already written in the IC card (1) inserted in the IC card read/write unit (2) or an information offering destination (1, 3, 4) designated by a user after the insertion of the IC card (1).

FIG. 1





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